

U.S. Application Serial No.: 10/655,584
Amendment Dated May 24, 2005
In Response to Office Action Dated February 25, 2005

Amendments to the Claims

This listing will replace all prior versions and listings of claims in the application:

Listing of Claims

Claims 1-40 (canceled)

41. (currently amended) An interconnect structure comprising:

a substrate;

a conductive material disposed on said substrate;

a porous or dense low k dielectric layer disposed on said conductive material,
wherein said low k dielectric layer has a single or dual damascene etched openings that
expose a surface of said conductive material; and

metallic lines and vias etched onto said low k dielectric layer;

wherein said exposed surface of said conductive material in said etched
openings has been treated with a condensable cleaning agent (CAA) and activated at a
temperature about -200 °C to about 25 °C to remove oxide, oxygen and carbon
containing residues from said surface of said conductive material;

wherein said porous or dense low k dielectric is selected from the group
consisting of: silicon-containing material formed from one or more of Si, C, O, F and H,
PE CVD materials having a composition Si, C, O, and H, a fluorosilicate glass (FSG), C
doped oxide, F doped oxide and alloys of Si, C, O and H.

42. (previously presented) The interconnect structure of Claim 41, further
comprising a liner material lining said metallic lines and vias.

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43. (previously presented) The interconnect structure of Claim 42, wherein said liner material is selected from the group consisting of: TiN, TaN, Ta, WN, W, TaSiN, TiSiN, WCN, Ru and a mixture thereof.

44. (canceled)

45. (previously presented) The interconnect structure of Claim 41, wherein said interconnect structure is placed in a first process chamber on a cold chuck to condense a layer of condensable cleaning agent within said etched openings on said substrate and thereafter activated in a second process chamber on a cluster tool.

46. (previously presented) The interconnect structure of Claim 41, wherein said metallic lines and vias are filled with Cu.

47. (previously presented) The interconnect structure of Claim 41, wherein said conductive material disposed on said substrate is selected from the group consisting of: W, Cu, Al, Ag, Au and alloys thereof.

48. (previously presented) The interconnect structure of Claim 47, wherein said conductive material is Cu.